

Anticorrosion Coatings from a Biomimetic Polymer

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Categories:

- Chemistry and Chemical Analysis
- Materials and Manufacturing

Keywords:

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Researchers at Purdue University have utilized a chemical compound, poly(catechol-styrene), to slow the rate of corrosion on metals. Corrosion often causes devices to stop working, so there is significant demand for technology that helps prevent corrosion and increase the lifespan of devices reliant on metal parts. Purdue researchers employed their previously developed adhesive inspired by naturally occurring adhesive proteins of marine mussels, poly(catechol-styrene), to function as a protective coating that repels the water and salts that induce corrosion. Compared to the control, carbon-steel strips coated in polystyrene, strips coated in poly(catechol-styrene) performed well, experiencing less rust and delamination around the strip's edges after exposure to saltwater. The protection in saltwater persisted at all time points tested, up to ten days. This new anti-corrosion coating offers immense potential in areas such as electronics manufacturing and construction engineering and is a viable alternative to the current acid, electrolysis, or other coating/treatment methods to protect corrosion-prone metals.

Advantages:

- Hydrophobic
- Bio-inspired
- Resists corrosion in saltwater

Applications:

- Manufacturing, Construction
- Water Treatment Systems
- Electricity, Oil, and Gas Production

Technology Validation:

Carbon-steel was coated with poly(catechol-styrene) using various application methods and resisted corrosion in saltwater at all time points tested, up to ten days.

People:

- Wilker, Jonathan J (Project leader)
- Lancelot, Alexandre Jacques

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Intellectual Property:

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